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NASA Procedural Requirements

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Chapter 3. Research and Program Support Operations

This chapter applies to NASA piloted aircraft research and program support operations.

3.1 Operations

3.1.1 Flight Authorization.

3.1.1.1 Center Chiefs of Flight Operations shall establish procedures to ensure that all flights of NASA aircraft are properly approved and documented, allowing for all contingencies such as deployed aircraft and aircraft ferry approvals. [92]

3.1.2 NASA Aircraft Use.

3.1.2.1 NASA aircraft are used primarily for research and development, program support, and mission management flights, including flights for:

a. Flight proficiency, including cross-country operations, to meet currency and annual requirements for assigned personnel.

b. Maintenance checks and/or ferry flights.

c. Logistics support for NASA programs.

3.1.2.2 Emergency lifesaving, humanitarian operations, and Homeland Security missions, as pre-approved by the Center Director, may be carried out in any NASA aircraft he/she designates; the circumstances shall be documented and reported to the Assistant Administrator for the Office of Infrastructure and Administration. [93]

3.2 Assignment of Pilot in Command of NASA Aircraft

3.2.1 The PIC of a NASA aircraft shall be a designated NASA pilot. [94] Designated NASA pilots are those who perform piloting duties as a part of their official position description, fulfill NASA contract requirements, or fly in accordance with an interagency agreement, such as a military pilot on loan to NASA. Center Chiefs of Flight Operations, with the concurrence of the Center Director, may designate as a PIC, on a temporary basis, individuals possessing required aeronautical qualifications to support NASA requirements.

3.2.2 The PIC of a NASA aircraft is responsible at all times for the safe operation of the aircraft and the safety of its occupants and is the final authority as to whether a flight will occur. The PIC is the final authority as to whether a flight will be delayed or diverted for reasons of weather, aircraft conditions, or other safety-related considerations.

3.2.3 The PIC of a NASA aircraft shall ensure the crew is briefed on the mission plan, safety procedures, and

emergency information, including emergency egress. [95]

3.2.4 Center Chiefs of Flight Operations shall have a process to train, designate, and document individuals authorized to pilot Functional Check Flight operations. [96]

3.3 Documentation.

Records pertaining to NASA flight activities shall include, at a minimum, the following:

a. Approval of mission.

b. Name and duty status of all on board.

c. Purpose of the flight.

d. Routing or flight events and takeoff /landing times. [97]

3.4 Flightcrew Requirements and Currency

3.4.1 NASA flightcrews shall be qualified in accordance with written standards set forth in Center-developed criteria. [98] Records of qualification and flight evaluation are required and shall be maintained in aircrew training records. [99] A review of pilot and crew qualifications shall be made prior to flight assignment to ensure that prerequisites for the intended mission are met. [100] The Center Chief of Flight Operations shall designate the crewmembers for aircraft that are under the Center's purview. [101]

3.4.2 NASA flightcrew members will be medically certified using NASA medical qualifications, per chapter 7 of this NPR.

3.4.3 A comprehensive pilot proficiency program is critical to flight safety at each Center for pilots flying research and program support aircraft. Such programs are specific to the assigned missions and reflect an in-depth evaluation of pilot proficiency and capability. Elements of pilot proficiency programs include the following:

3.4.3.1 Center Flight Operations shall impose sufficient proficiency requirements or flight time/sortie requirements on flightcrews to meet mission needs. [102] Center flightcrew currency shall, at a minimum, include the following:

a. Annual night flying requirements.

b. Landings in category (fixed-wing/rotorcraft).

c. Six instrument approaches under actual or simulated conditions within six calendar months.

d. Method to regain instrument or landing currency, once lapsed.

e. Completing 100 hours of flight time per fiscal year, PICs must fly at least 50 of those hours as PIC. The hours shall be flown in any aircraft or flight simulator approved by the Center Chief of Flight Operations. [103]

3.4.3.2 Center directives shall establish separate aircrew qualification and currency requirements for unique aircraft (e.g., project, military, experimental) in which the aircrew cannot meet the above requirements. [104]

3.4.4 Flight proficiency shall be evaluated at least once per year by a NASA or NASA-designated pilot who is an instructor or examiner pilot in the aircraft used for the evaluation. [105] When available, a suitable simulator or its equivalent may be used for this purpose at the discretion of the Center Chief of Flight Operations. Evaluations conducted by Federal Aviation Regulations (FAR) part 142 Training Centers also may be used to satisfy pilot annual evaluations at the discretion of the Center Chief of Flight Operations.

3.4.5 Pilot Instrument Evaluations. Instrument flying proficiency shall be evaluated at least once per year using professional aeronautical standards such as FAA Instrument Practical Test Standards. [106] The instrument evaluation may be combined with the annual proficiency evaluation or completed separately. The instrument proficiency check may be accomplished in a simulator approved by the Center Chief of Flight Operations.

3.4.6 Simulations. Annual flight simulator training in each aircraft category (fixed-wing/rotorcraft) is required if available. Realistic, mission-oriented scenarios may be used to complement the annual proficiency and instrument check requirements.

3.4.7 Tests. Written tests shall be administered and reviewed annually by a check pilot to ensure current pilot knowledge of air traffic control procedures, aircraft systems, normal and emergency operating procedures, Agency and local instructions, and other pertinent regulations and procedures. [107] Centers co-located with military organizations who conduct "instrument schools" may substitute such training for the above air traffic control procedural testing.

3.4.8 Reviews. Pilot annual flight evaluations shall be reviewed by the Center Chief of Flight Operations or designee. [108]

3.4.9 Guest Pilots/Researchers and Media Flights. Each Center Chief of Flight Operations shall establish local instructions regarding training and currency requirements that must be met for a guest pilot/researcher. [ ] The Center shall establish policies for flying media representatives. [110]

3.4.10 Flight Engineers shall possess an FAA Flight Engineer Certificate appropriate for the aircraft category or equivalent military certification. [111] Centers shall develop alternate training programs to satisfy this requirement should the above personnel not be available. [112]

3.4.11 Qualified non-crewmembers shall be authorized by the Chief of Flight Operations to participate in flight operations to support mission requirements. [113] Qualified non-crewmembers shall be trained and will maintain qualification in accordance with local Center policies and procedures which shall, at a minimum, include cabin emergency and egress procedures. [114] Qualified non-crewmembers are not passengers. Their presence on a flight is in direct support of, or associated with, the flight or mission that the flight is supporting. Examples of qualified non-crewmembers include, but are not limited to, media representatives observing the mission, scientists conducting in-flight experiments, and mechanics or mission managers who support the mission or flight on the ground.

3.5 Ground Training

Each primary crewmember must receive ground training as specified in section 4.13.

3.6 Readiness Reviews

3.6.1 The readiness reviews may be split into two review categories, a Flight Readiness Review (FRR)/Operations Readiness Review (ORR) and a Mission Readiness Review (MRR). The FRR/ORR focuses on flight operational safety. The MRR focuses on mission operational safety using multiple aircraft and multiple activities to ensure mission success. Program managers shall conduct an MRR when multiple aircraft operations are to be conducted. [115] FRRs/ORRs and MRRs apply to both piloted aircraft and UASs. Prior to conducting an FRR/ORR, each individual aircraft involved in the flight or campaign shall have an approved Certificate of Airworthiness. [116]

3.6.2 Personnel who should attend these reviews include the Safety and Mission Assurance Office, the mission manager and/or Principal Investigator, the Range Safety personnel, the Flight Operations personnel, the ASO, and, in the case of UAS operations, the UAS operator. The chairman of the Center Airworthiness Process Program or a representative shall attend all readiness reviews. [117]

3.6.3 An FRR/ORR reviews the operational requirements for a specific flight or campaign. A supervisory Flight Operations pilot or other Flight Operations supervisory personnel shall chair and approve the FRR/ORR flight authorization. [118] Areas of consideration will include:

a. Science mission requirements.

b. Flight operations procedures.

c. Operational Go/No-Go criteria.

d. Pilot qualifications, flight operations training, and flight manuals.

e. UAS operations requirements.

f. Aircraft configuration.

g. Aircraft maintenance.

h. Science payload and operations.

i. Payload combination.

j. Status of reviews.

k. Science functional flight test plan.

l. Pre-accident and/or incident plan.

3.6.4 An MRR reviews the mission interoperability of multiple aircraft from multiple activities to ensure mission success for a specific flight event or campaign. Activities may be different Centers, other Federal agencies, military services, commercial vendors, or non-NASA aircraft. Prior to conducting an MRR, each aircraft involved in the flight or campaign shall have an approved FRR/ORR. [119]

3.6.4.1 The program/project management of the flight/campaign event shall assign an individual to chair and make the MRR evaluation and who has authorization to proceed with the flight program. [120] The focus of this review is to ensure that the Principal Investigators and the flightcrews or UAS operators have made the coordination and arrangements required to maximize operational safety and ensure mission success. The MRR shall consider the

following:

a. Flight experiment and science flight requirements.

b. Organizational and functional chart.

c. Payload status.

d. Flight operations procedures.

e. Aircraft separation/coordination.

f. Communication plan.

g. Inter-Center/interagency communication/coordination plan.

h. Ground operations procedures dealing with hazardous systems.

i. Schedule timeline.

j. Roles and responsibilities.

k. Science coordination requirements.

l. Pre-accident and/or incident notification plan.

m. Liability coverage.

n. Deployment.

o. Logistics.

p. Public affairs/outreach.

q. Mission assurance. [121]

3.6.5 Centers, Component Facilities, and contractors that do not have an aircraft operations department and operate NASA aircraft/UASs shall coordinate with an alternate NASA Center aircraft operations department for FRR/ORR and MRR services and support. [122]

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